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FOX, JAMAL A

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4

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/596,003

Applicant(s)

SHABTAY ET AL.

Examiner

Jamal A Fox

Art Unit

2664

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-80 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28, 31-51, 54, 55, 57, 59-61, 63-68, 70-72, 74-76 and 78-80 is/are rejected.
- 7) ☒ Claim(s) 29, 30, 52, 53, 56, 58, 62, 69, 73 and 77 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 June 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2 and 3.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1, 2, 5-7, 9, 16-23, 45-48, 70 and 78-80 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,118,760 to Zauman et al.

Referring to claim 1, Zauman et al. discloses a method of performing policy enforcement (QoS, lines 39-56) by a switch (Fig. 1), comprising: receiving a plurality of frames (arrived packet, col. 5 lines 43-45); examining at least some of the received frames to determine (evaluated, col. 5 lines 45-50) whether they require non default policy enforcement (identification of subsystem ports, col. 5 lines 47-51) according to

pre-programmed policy rules (certain QoS, col. 5 lines 50-51) which pertain to at least one protocol (packet types, col. 5 lines 45-50); and forwarding, with default policy handling (software routines, col. 5 lines 55-56), at least some of the received frames which belong to the protocol to which the rules pertain, regardless of the policy enforcement they require (col. 5 lines 50-56).

Referring to claim 2, Zauman et al. discloses a method according to claim 1, comprising applying non-default policy enforcement to the examined frames which so require (identification of subsystem ports, col. 5 lines 47-51).

Referring to claim 5, Zauman et al. discloses a method according to claim 1, wherein examining at least some of the received frames to determine whether they require non-default policy enforcement comprises determining the required quality of service (QoS, col. 5 lines 48-51) of the frames.

Referring to claim 6, Zauman et al. discloses a method according to claim 1, wherein examining at least some of the received frames to determine whether they require non-default policy enforcement comprises determining whether the at least some of the received frames require sniffing or counting (counter, col. 8 lines 21-28).

Referring to claim 7, Zauman et al. discloses a method according to claim 1, wherein examining the at least some of the received frames comprises comparing values of one or more of the fields of the frames to respective fields in a list of policies of groups of frames (evaluated, col. 5 lines 45-49).

Referring to claim 9, Zauman et al. discloses a method according to claim 7, wherein examining at least some of the received frames comprises checking frames for

which no match was found in the comparison to the list against the pre-programmed rules (all of the received frames are checked, see evaluated col. 5 lines 45-50).

Referring to claim 16, Zauman et al. discloses a method according to claim 1, wherein forwarding, with default policy handling, at least some of the frames comprises forwarding, with default policy handling, frames which include IP packets (IP, col. 5 lines 10-14 and col. 6 lines 4-5).

Referring to claim 17, Zauman et al. discloses a method according to claim 1, wherein forwarding, with default policy handling, at least some of the received frames regardless of the policy enforcement they require comprises forwarding, with default policy handling, substantially all the frames received from one or more specific physical ports of the switch (ports, col. 5 lines 48-54 and col. 6 lines 12-16).

Referring to claim 18, Zauman et al. discloses a method according to claim 17, wherein the one or more specific physical ports (Assoc. Mem 114, Fig. 1 and respective portions of the spec.) are connected to switches (Switching Element 111, Fig. 1 and respective portions of the spec.), which perform policy enforcement.

Referring to claim 19, Zauman et al. discloses a method according to claim 17, wherein the one or more specific physical ports are not connected directly to end-stations (Fig. 1 and respective portions of the spec.).

Referring to claim 20, Zauman et al. discloses a method according to claim 1, wherein forwarding, with default policy handling, at least some of the received frames regardless of the policy enforcement they require comprises forwarding, with default

policy handling, frames received with indications that the frames underwent policy enforcement (wildcards, col. 6 lines 17-27).

Referring to claim 21, Zauman et al. discloses a method according to claim 1, wherein forwarding, with default policy handling (software routines, col. 5 lines 55-56), at least some of the received frames regardless of the policy enforcement they require comprises forwarding the at least some of the received frames without determining the policy they require (col. 5 lines 50-56).

Referring to claim 22, Zauman et al. discloses a method according to claim 1, wherein forwarding, with default policy handling (software routines, col. 5 lines 55-56), at least some of the received frames regardless of the policy enforcement they require comprises forwarding at least one frame with a policy different than required by the preprogrammed rules (certain QoS, col. 5 lines 50-51).

Referring to claim 23, Zauman et al. discloses a method according to claim 1, wherein forwarding, with default policy handling, at least some of the received frames regardless of the policy enforcement they require comprises forwarding, with default policy handling, frames which require policy handling which differs from the default only in the required quality of service (QoS, col. 5 lines 50-56).

Referring to claim 45, Zauman et al. discloses a switch (Fig. 1) for forwarding frames (col. 5 lines 39-56), comprising:
at least one port (subsystem ports, col. 5 lines 49-51) which receives frames;
a table (address table and hash table, col. 5 lines 15-39) which includes entries which list policies of groups of frames; and

a hardware unit (Fig. 1, network element 101 and col. 5 lines 39-56) which compares (evaluated, col. 5 lines 45-50) the values of one or more fields of at least some of the received plurality of frames to entries of the table and forwards with a default policy (software routines, col. 5 lines 55-56) at least some of the frames for which no match (no matching entry, col. 5 lines 53-56) was found in the comparison.

Referring to claim 46, Zauman et al. discloses a switch (Fig. 1) according to claim 45, comprising a processor (Fig. 1, CPS 130 and respective portions of the spec.) which analyzes at least some of the frames for which no match was found in the comparison.

Referring to claim 47, Zauman et al. discloses a switch (Fig. 1) according to claim 45, wherein the policy table comprises a plurality of groups of entries with different key fields (fields, col. 6 line 2-11).

Referring to claim 48, Zauman et al. discloses a switch according to claim 45, wherein the policy table comprises at least one field which receives wildcard values (wildcards, col. 6 lines 17-39).

Referring to claim 70, Zauman et al. discloses a method of updating a policy table (Fig. 2) of a switch, comprising:
receiving (newly arrived packet at the subsystem 110, col. 5 lines 40-45) a frame which is not directed to the switch;
creating an entry (processed by a hardware class filter, col. 5 lines 40-50) in the policy table of the switch, for the session to which the received frame belongs; and

performing layer-2 switching of the received frame (col. 5 lines 25-39 and col. 3 lines 35-45).

Referring to claim 78, Zauman et al. discloses a packet based network (Fig. 1), comprising: a plurality of at least three switches (Switching Element, Fig. 1) which perform layer-2 switching of frames; one or more links (Fig. 1, ref. sign 141 and 151) which connect the plurality of switches to each other, at least 50% of the switches comprising a policy unit (hardware class filter in the switching element 111, col. 5 lines 43-56) which performs policy enforcement (identifies the packet, col. 5 lines 45-56) on at least some of the frames transmitted within the network.

Referring to claim 79, Zauman et al. discloses a network according to claim 78, wherein substantially all the switches in the network comprise a policy unit (hardware class filter in the switching element 111, col. 5 lines 43-56 and Fig. 1, Switching Element) which performs policy enforcement on at least some of the frames transmitted within the network.

Referring to claim 80, Zauman et al. discloses a network according to claim 78, wherein at least some of the policy units of the switches perform different groups (Fig. 2, ref. sign 114 and QoS, col. 5 lines 48-52) of policy enforcement tasks.

3. Claims 37-40, 49, 55, 57, 59-61 and 64 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,658,002 to Ross et al.

Referring to claim 37, Ross et al. discloses a method of performing policy enforcement by a switch, comprising: receiving a plurality of frames (col. 4 lines 65-67); determining (CAM lookup, col. 5 lines 5-10) whether to compare the values of one or

more fields of at least some of the plurality of frames to entries of a list of policies of groups of frames (Fig. 4); comparing (flow label, col. 5 lines 5-10) the values of one or more fields (Fig. 4) of the determined frames to respective fields of entries of the list; and forwarding, discarding (deny, col. 5 lines 23-30) or further analyzing frames determined not to be compared.

Referring to claim 38, Ross et al. discloses a method according to claim 37, wherein determining whether to compare comprises determining based on the physical port from which the frame was received (col. 8 lines 11-31 and col. 10 line 52-col. 11 line 3).

Referring to claim 39, Ross et al. discloses a method according to claim 37, wherein determining whether to compare comprises determining based on the protocol of the frame (col. 13 lines 50-60).

Referring to claim 40, Ross et al. discloses a method according to claim 37, wherein further analyzing comprises transferring to a processor of the switch (DBus, col. 7 lines 55-67).

Referring to claim 49, Ross et al. discloses a method of performing policy enforcement by a switch, comprising: receiving a plurality of frames; comparing at least some of the received frames to a list of groups of frames and respective policies (col. 5 lines 7-22); and creating entries in the list for less than all of the compared frames for which no match was found in the comparison to the list (col. 5 lines 23-30).

Referring to claim 55, Ross et al. discloses a method (Fig. 5) of forwarding a frame by a switch, comprising:

receiving a frame (receipt of a frame of data 510, col. 9 lines 51-55);
checking one or more layer-3 or above fields of the frame for adherence to security rules (Fig. 5, Perform Logical Operations 550); and -
performing layer-2 hardware switching (Fig. 5 ref. sign 570) of the frame, if the frame adheres to the security rules (ACL Label, Fig. 5 ref. sign 560).

Referring to claim 57, Ross et al. discloses a method according to claim 55, wherein checking the frame for adherence to security rules comprises checking by a hardware unit (CAM, Fig. 5 ref. sign 580 and respective portion of the spec.).

Referring to claim 59, Ross et al. discloses a method according to claim 55, wherein checking for adherence to security rules comprises checking by a hardware unit (CAM, Fig. 5 ref. sign 580 and respective portion of the spec.).

Referring to claim 60, Ross et al. discloses a switch (Fig. 3 and respective portions of the spec.) for forwarding frames, comprising:
at least one port (Fig. 3, ref. Sign 310 and respective portions of the spec.) which receives frames;
a security unit (Fig. 3, ACL Label 405 and respective portions of the spec.) which checks the received frames for adherence to security rules; and
a forwarding unit (Flow Label 400, col. 8 lines 11-31, here it is understood that the information in the Flow Label depends on the types of Layer 2 protocols (see col. 13 lines 50-67)) which performs layer-2 switching of frames which adhere to the security rules.

Referring to claim 61, Ross et al. discloses a switch according to claim 60, wherein the security unit comprises a policy table (Fig. 4 and respective portions of the spec., here it is understood that the Flow Label is used as the key comparand) which has a plurality of entries to which the received frames are compared.

Referring to claim 64, Ross et al. discloses a switch according to claim 60, wherein the security unit comprises a hardware unit (Fig. 3, CAM 350).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3, 4 and 75 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zauman et al in view of Ross et al. Referring to claim 3, Zauman et al. discloses a method according to claim 1, wherein examining at least some of the received frames to determine whether they require non-default policy enforcement (identification of subsystem ports, col. 5 lines 47-51), but does not teach of determining whether the at least some of the received frames adhere to user pre-programmed security rules. Ross et al. discloses pre-programmed security rules (ACL, col. 2 lines 26-38). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included the pre-programmed security rules of Ross et al. to the invention of Zauman et al. in order for the CAM to enhance the efficiency of rule

processing by providing an additional level of flexibility for rule element checking as suggested by Ross et al.

Referring to claim 4, Zauman et al. discloses a method according to claim 3, comprising discarding examined frames which do not adhere to the security rules (removed entry, col. 4 lines 34-42).

Referring to claim 75, Zauman et al. discloses a method according to claim 71, but does not explicitly teach wherein determining whether the received frame requires non-default policy enforcement comprises checking whether the frame violates security rules. However, Ross et al. discloses security rules (ACL, col. 2 lines 26-38). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included determining whether the received frame requires non-default policy enforcement comprises checking whether the frame violates security rules in order for the CAM to enhance the efficiency of rule processing by providing an additional level of flexibility for rule element checking as suggested by Ross et al.

6. Claims 8, 10-15, 24-28, 31-36, 41-44, 71, 72, 74 and 76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zauman et al. Referring to claim 8, Zauman et al. discloses a method according to claim 7, wherein forwarding at least some of the frames regardless of the policy enforcement they require comprises forwarding, with default policy handling but does not explicitly teach of, non-leading frames of sessions of a connection-based protocol for which no match was found in the comparing to the list. However, the ability to match specific packets to be forwarded is disclosed in (col. 7

lines 15-24). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included forwarding non-leading frames of sessions of a connection-based protocol for which no match was found in the comparing to the list in order to manage the entries in a forwarding memory as suggested by Zauman et al.

Referring to claim 10, Zauman et al. discloses a method according to claim 1, wherein forwarding at least some of the frames regardless of the policy enforcement they require comprises forwarding, with default policy handling but does not explicitly teach of, substantially all non-leading frames of sessions of a connection-based protocol. However, TCP, which is a connection-based protocol, is disclosed in (col. 5 lines 7-14). Furthermore, the ability to match specific packets to be forwarded is disclosed in (col. 7 lines 15-24). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included forwarding, substantially all non-leading frames of sessions of a connection-based protocol in order to manage the entries in a forwarding memory as suggested by Zauman et al.

Referring to claim 11, Zauman et al. discloses a method according to claim 10, wherein forwarding, with default policy handling, but does not explicitly teach of substantially all non-leading frames of sessions of a connection-based protocol comprises forwarding with default policy handling substantially all frames starting with the third frame of two-way sessions of a connection-based protocol. However, TCP, which is a connection-based protocol, is disclosed in (col. 5 lines 7-14). Furthermore, the ability to match specific packets to be forwarded is disclosed in (col. 7 lines 15-24).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included forwarding substantially all non-leading frames of sessions of a connection-based protocol comprises forwarding with default policy handling substantially all frames starting with the third frame of two-way sessions of a connection-based protocol in order to manage the entries in a forwarding memory as suggested by Zauman et al.

Referring to claim 12, Zauman et al. discloses a method according to claim 10 but does not explicitly teach of forwarding all non-leading frames of sessions of a connection-based protocol comprises forwarding, with default policy handling,

substantially all frames starting with the second frame of two-way sessions of a connection based protocol. However, TCP, which is a connection-based protocol, is disclosed in (col. 5 lines 7-14). Furthermore, the ability to match specific packets to be forwarded is disclosed in (col. 7 lines 15-24). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included forwarding all non-leading frames of sessions of a connection-based protocol comprises forwarding, with default policy handling, substantially all frames starting with the second frame of two-way sessions of a connection based protocol in order to manage the entries in a forwarding memory as suggested by Zauman et al.

Referring to claim 13, Zauman et al. discloses a method according to claim 10, wherein the connection-based protocol comprises the TCP protocol (col. 7 lines 15-24).

Referring to claim 14, Zauman et al. discloses a method according to claim 10, but does not explicitly disclose wherein examining at least some of the received frames

comprises examining leading frames of sessions of connection based protocols. However, TCP, which is a connection-based protocol, is disclosed in (col. 5 lines 7-14). Furthermore, the ability to match specific packets to be forwarded is disclosed in (col. 7 lines 15-24). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included leading frames of sessions of connection based protocols in order to manage the entries in a forwarding memory as suggested by Zauman et al.

Referring to claim 15, Zauman et al. discloses a method according to claim 10, wherein examining at least some of the received frames comprises examining frames of connectionless protocols. However, TCP, which is a connection-based protocol, is disclosed in (col. 5 lines 7-14). Furthermore, the ability to match specific packets to be forwarded is disclosed in (col. 7 lines 15-24). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included examining leading frames of sessions of connection based protocols in order to manage the entries in a forwarding memory as suggested by Zauman et al.

Referring to claim 24, Zauman et al discloses a method of performing policy enforcement (QoS, lines 39-56) by a switch (Fig. 1), comprising: receiving a plurality of frames (arrived packet, col. 5 lines 43-45); comparing the values of one or more fields of at least some of the plurality of frames to entries of a list (evaluated, col. 5 lines 45-50); and forwarding at least some of the frames for which no match was found in the comparison without performing additional analysis (software routines, col. 5 lines 55-56), but does not explicitly teach of determining whether to additionally analyze the

frames for which no match was found in the comparison; additionally analyzing at least some of the frames for which no match was found in the comparison. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to determine whether to additionally analyze the frames for which no match was found in the comparison; and to additionally analyze at least some of the frames for which no match was found in the comparison because the Central Processing System (CPS) contains a programmed Central Processing Unit (CPU) and a central memory that couples to different subsystems. Each subsystem has a hardware search engine, a switching element coupled to a forwarding memory and associated memory. The forwarding memory may be implemented by a programmed processor which makes analytical and forwarding decisions as suggested by Zauman et al.

Referring to claim 25, Zauman et al. discloses a method according to claim 24, wherein the list (address table, col. 5 lines 25-30) identifies frames (identifies the packet, col. 5 lines 45-48) which may be forwarded without violating security rules.

Referring to claim 26, Zauman et al. discloses a method according to claim 24, wherein additionally analyzing at least some of the frames for which no match was found in the comparison comprises analyzing those frames belonging to connectionless protocols (UDP, col. 5 lines 7-14).

Referring to claim 27, Zauman et al. discloses a method according to claim 24, but does not explicitly teach of wherein additionally analyzing at least some of the frames for which no match was found in the comparison comprises analyzing leading frames of sessions of connection based protocols. However, TCP, which is a

connection-based protocol, is disclosed in (col. 5 lines 7-14). Furthermore, the ability to match specific packets to be forwarded is disclosed in (col. 7 lines 15-24). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included additionally analyzing at least some of the frames for which no match was found in the comparison comprises analyzing leading frames of sessions of connection based protocols in order to manage the entries in a forwarding memory as suggested by Zauman et al.

Referring to claim 28, Zauman et al. discloses a method according to claim 24, wherein the one or more fields comprise source and destination address fields (Fig. 2 ref. sign 221 and col. 6 lines 2-11).

Referring to claim 31, Zauman et al. discloses a method according to claim 24, but does not explicitly teach wherein forwarding without performing additional

analysis comprises forwarding those frames which are non-leading frames of connection based protocol sessions. However, TCP, which is a connection-based protocol, is disclosed in (col. 5 lines 7-14). Furthermore, the ability to match specific packets to be forwarded is disclosed in (col. 7 lines 15-24). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included forwarding without performing additional analysis comprises forwarding those frames which are non-leading frames of connection based protocol sessions in order to manage the entries in a forwarding memory as suggested by Zauman et al.

Referring to claim 32, Zauman et al. discloses a method according to claim 24, wherein determining whether to additionally analyze comprises determining based on at least one field not included in the comparison (col. 6 lines 12-16).

Referring to claim 33, Zauman et al. discloses a method according to claim 24, but does not explicitly teach wherein determining whether to additionally analyze comprises determining the protocol to which the frame belongs. However, TCP, IP and UDP are disclosed in (col. 5 lines 7-15 and col. 6 lines 1-16). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included determining whether to additionally analyze comprises determining the protocol to which the frame belongs in order to identify internal and/or external ports of the inbound subsystem, queueing, priority, header replacement information for routing, age, and distributed flow indication as suggested by Zauman et al.

Referring to claim 34, Zauman et al. discloses a method according to claim 24, wherein the additional analysis is performed by a separate unit (Fig. 1, CPS 130 has software routines, col. 5 lines 55-56) than performs the comparison.

Referring to claim 35, Zauman et al. discloses a method according to claim 34, wherein the comparison is performed by a hardware unit (Fig. 1) of the switch and the additional analysis is performed by a processor (Fig. 1, CPS 130 and respective portions of the spec.) of the switch.

Referring to claim 36, Zauman et al. discloses a method according to claim 35, wherein the entries of the list are stored in a storage area of the hardware unit (col. 5 lines 25-39).

Referring to claim 41, Zauman et al. discloses a switch (Fig. 1) for forwarding frames, comprising: at least one port (subsystem ports, col. 5 lines 49-51) which receives frames; and a table (address table and hash table, col. 5 lines 15-39) which includes entries which list policies (QoS, col. 5 lines 25-30 and col. 5 lines 48-53) of groups of frames, and indicates for at least one of the entries different behavior (wild cards, col. 6 lines 33-54) for leading (header data, col. 6 lines 33-54), but does not explicitly teach of non-leading frames of sessions matching the entry. However, the ability to match specific packets to be forwarded is disclosed in (col. 7 lines 15-24). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included non-leading frames of sessions matching the entry in order to provide finer granularity over packet forwarding in order to specifically define priority and QoS for certain packets.

Referring to claim 42, Zauman et al. discloses a switch according to claim 41, comprising a hardware unit (Fig. 1, network element 101 and col. 5 lines 39-56) which forwards the non-leading frames of sessions matching the at least one of the entries which indicate different behavior for leading and non-leading frames, without further analysis.

Referring to claim 43, Zauman et al. discloses a switch according to claim 41, comprising a processor (Fig. 1, CPS 130 and respective portions of the spec.) which analyzes the leading frames of sessions matching the at least one of the entries which indicate different behavior for leading and non-leading frames.

Referring to claim 44, Zauman et al. discloses a switch according to claim 41, wherein each entry of the table matches frames of a plurality of sessions (col. 6 lines 12-16).

Referring to claim 71, Zauman et al. discloses a method according to claim 70, comprising determining whether the received frame requires non-default policy enforcement (col. 5 lines 45-56), but does not explicitly teach of creating the entry is performed only if the received frame requires non-default policy enforcement. However, the CPS 130 can be configured to handle the forwarding aspects based on its software routines (col. 5 lines 50-56). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included creating the entry is performed only if the received frame requires non-default policy enforcement because the software routines can be configured to handle the forwarding aspects as suggested by Zauman et al.

Referring to claim 72, Zauman et al. discloses a method according to claim 71, wherein the received frame belongs to a connection based protocol (TCP, col. 5 lines 7-14 and col. 6 line 10).

Referring to claim 74, Zauman et al. discloses a method according to claim 71, wherein determining whether the received frame requires non-default policy enforcement comprises checking whether the frame belongs to a group which requires frame counting (counter, col. 8 lines 21-28).

Referring to claim 76, Zauman et al. discloses a method according to claim 71, wherein determining whether the received frame

requires non-default policy enforcement comprises checking whether the frame requires a non default QoS behavior (QoS, col. 5 lines 48-56).

7. Claims 50, 51, 54, 63 and 65-68 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ross et al.

Referring to claim 50, Ross et al. discloses a method according to claim 49, but does not explicitly teach wherein creating entries in the list for less than all of the compared frames comprises creating entries only for frames received through physical ports connected to end-stations. However, Ross et al. discloses router ports (col. 8 lines 19-38). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included creating entries in the list for less than all of the compared frames comprises creating entries only for frames received through physical ports connected to end-stations in order to identify the source network connection and associate a given network connection with the access control list defined for that interface as suggested by Ross et al.

Referring to claim 51, Ross et al. discloses a method according to claim 49, but does not explicitly teach wherein creating entries in the list for less than all of the compared frames comprises creating entries only for frames belonging to connectionless protocols. However, Ross et al. discloses UDP, which is a connectionless protocol in (col. 13 line 65-col. 14 line 63). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included creating entries in the list for less than all of the compared frames comprises creating entries only for frames belonging to connectionless protocols

because ACLs give you the ability to specify which protocols and/or frames to permit or deny as suggested by Ross et al.

Referring to claim 54, Ross et al. discloses a method according to claim 49, but does not explicitly teach of comprising determining for compared frames, a probability that additional frames of the same session will be received by the switch and creating entries only for frames with a probability higher than a determined level. However, Ross et al. discloses pre-processing of the elements of the flow label (col. 7 lines 40-52) and a Layer 4 Mapping Unit (col. 8 lines 11-63), which provides logical operations.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included comprising determining for compared frames, a probability that additional frames of the same session will be received by the switch and creating entries only for frames with a probability higher than a determined level in order to prevent multiple entries in a CAM that apply to a given complex rule so that CAM size is limited and cost of the device stays minimal as suggested by Ross et al.

Referring to claim 63, Ross et al. discloses a switch according to claim 60, but does not explicitly teach wherein the switch cannot perform layer-3 routing. However, information in the flow label depends on the types of Layer 2, Layer 3 and Layer 4 protocols (col. 13 lines 51-60). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included that the switch cannot perform layer-3 routing because if the flow label does not include a Layer 3 protocol it cannot be routed as suggested by Ross et al.

Referring to claim 65, Ross et al. discloses a switch for forwarding frames, comprising: at least one port which receives frames (Fig. 3, ref. Sign 310 and respective portions of the spec.); a policy table which includes entries, addressed by at least two key fields (Fig. 4), for sessions which should receive non-default policy behavior (col. 5 lines 7-22); a policy unit (Fig. 3, SRAM 355, and col. 5 lines 23-30) which checks whether at least some of the received frames which do not have respective entries in the policy table require non-default policy behavior; and a forwarding unit (Fig. 3, Forwarding Engine 370 and respective portions of the spec.), but does not explicitly teach of the forwarding unit performing layer-2 switching of the at least some of the received frames in accordance with the policy behavior determined by the policy unit. However, information in the flow label depends on the types of Layer 2 protocols (col. 13 lines 51-60). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have included the forwarding unit performing layer-2 switching of the at least some of the received frames in accordance with the policy behavior determined by the policy unit in order to perform CAM lookups by sending a flow label to the CAM for comparison as suggested by Ross et al.

Referring to claim 66, Ross et al. discloses a switch according to claim 65, wherein the policy unit also checks (reading, col. 5 lines 23-30) whether received frames which have respective entries in the policy table require non-default policy behavior.

Referring to claim 67, Ross et al. discloses a switch according to claim 66, wherein the policy unit comprises a hardware unit (Fig. 3, SRAM 355 and respective portions of the spec.) which checks received frames which have respective entries and a processor (ACL processing, col. 5 lines 25-30) which checks received frames which do not have respective entries in the table.

Referring to claim 68, Ross et al. discloses a switch according to claim 66, wherein the entries of the table are addressed by at least the IP source (IP source address, Fig. 4) and destination addresses (IP destination address, Fig. 4) of the received frames.

Allowable Subject Matter

8. Claims 29, 30, 52, 53, 56, 58, 62, 69, 73 and 77 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

or faxed to:

(703) 305-3988, (for formal communications intended for entry)

Or:

(703) 305-3988 (for informal or draft communications, please label
"PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2121
Crystal Drive, Arlington, VA. 22202, Sixth Floor (Receptionist).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jamal A. Fox whose telephone number is (703) 305-5741. The examiner can normally be reached on Monday-Friday 6:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wellington Chin can be reached on (703) 305-4366. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9315 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

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J.A.F.

Jamal A. Fox



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